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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/600,619	06/23/2003	Jong-Pyng Chen	0941-0761P	6841

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BIRCH STEWART KOLASCH & BIRCH  
PO BOX 747  
FALLS CHURCH, VA 22040-0747

EXAMINER

CREPEAU, JONATHAN

ART UNIT PAPER NUMBER

1746

DATE MAILED: 04/18/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

10/600,619

Applicant(s)

CHEN ET AL.

Examiner

Jonathan S. Crepeau

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1746

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 23 June 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-21 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-21 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 23 June 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
- 1) ☒ Certified copies of the priority documents have been received.
  - 2) ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - 3) ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date <u>9-23-03 6-23-03</u> | 6) <input type="checkbox"/> Other: _____  |

## **DETAILED ACTION**

### ***Claim Objections***

1. Claim 6 is objected to under 37 CFR 1.75(c), as being of improper dependent form for failing to further limit the subject matter of a previous claim. Applicant is required to cancel the claim(s), or amend the claim(s) to place the claim(s) in proper dependent form, or rewrite the claim(s) in independent form. Claim 6 recites a plurality of species that do not appear to further limit the species recited in parent claim 5. Correction or clarification is required.

### ***Claim Rejections - 35 USC § 103***

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 1-4 and 6-21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Murphy et al (U.S. Patent 6,059,943).

The reference is directed to a composite membrane for use in a direct methanol fuel cell. The membrane comprises an inorganic material dispersed in a polymer matrix. The inorganic material may comprise, among other materials, silica, zirconium phosphate, and heteropolyacids

(see cols. 3 and 4). The base polymer may comprise polyvinylidene difluoride (PVDF) and polysulfone, among other materials (see col. 8, line 63 et seq.).

The reference does not expressly teach a layered membrane comprising an organic/inorganic composite membrane and a proton exchange membrane, as recited in claims 1, 13, and 19.

However, the invention as a whole would have been obvious to one of ordinary skill in the art at the time the invention was made because such a multi-layered structure would be rendered obvious by the disclosure of Murphy et al. The instant claims do not specify the material of the second “proton exchange membrane” layer. As such, the mere duplication of the layers of Murphy et al. reads on the claim language. It has generally been held that the duplication of parts is not patentably distinguishable unless a new or unexpected result is produced (MPEP 2144.04). In this case, the use of a layered laminate membrane, each layer having the same composition, would not provide a new or unexpected result over simply using one membrane as disclosed in the reference.

Regarding the methanol permeability and ion conductivity ranges recited in the instant claims, these ranges would be rendered obvious by Murphy et al. In column 10, line 50, the reference discusses ion conduction and the “barrier properties” of the membrane. As such, the reference provides sufficient guidance to optimize these values.

Regarding claims 13-18, the claimed method steps would be rendered obvious by Murphy. The reference discloses several methods of making the membrane starting at column 11, line 65, including the step of blending the inorganic material into the organic polymer.

Further, as a method of making a two-layer structure as discussed above, it would be obvious to perform a thermal pressing step using an adhesive. As such, the claimed method steps are not considered to distinguish over the reference.

4. Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over Murphy et al. as applied to claims 1-4 and 6-21 above, and further in view of Asukabe et al (U.S. Pre-Grant Publication No. 2001/0026893).

Murphy et al. do not expressly teach that the base polymer comprises PVDF-g-SPS, as recited in claim 5.

Asukabe et al. is directed to a polymer electrolyte membrane comprising, among other materials, PVDF-g-SPS (see pars. 33 and 34).

Therefore, the invention as a whole would have been obvious to one of ordinary skill in the art at the time the invention was made because the artisan would be motivated to use the PVDF-g-SPS of Asukabe et al. in the membrane of Murphy et al. In paragraph 36, the Asukabe reference lists numerous advantages of the invention, including good electrode adherence, easy humidification, and excellent stability. As such, the artisan would be motivated to use the PVDF-g-SPS of Asukabe et al. in the membrane of Murphy et al.

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***Conclusion***

5. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jonathan Crepeau whose telephone number is (571) 272-1299.

The examiner can normally be reached Monday-Friday from 9:30 AM - 6:00 PM EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael Barr, can be reached at (571) 272-1414. The phone number for the organization where this application or proceeding is assigned is (571) 272-1700. Documents may be faxed to the central fax server at (571) 273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Jonathan Crepeau  
Primary Examiner  
Art Unit 1746  
April 14, 2006